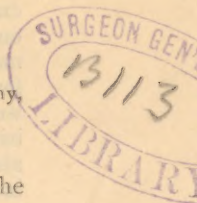


SEVERAL CASES OF CATARACT,
ILLUSTRATING THE IMPORT-
ANCE OF PROF. H. KNAPP'S
METHOD OF EXTRACTION.

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DOCTOR KNAPP'S method embraces the following steps: Incision of the cornea at the sclero-corneal junction; iridectomy; incision at the margin of the lens to the extent of the iridectomy, with a delicate curved bistoury; the removal of the lens by the usual manipulations; *avoiding any attempt to lacerate the anterior capsule with the cystome at the primary operation.* As soon as the eye has healed (in from two to three weeks usually) he enters the cornea with a delicate needle-knife, using oblique light, and makes, at the center of the capsule, inverted J-shaped incisions, the edges of which retract and leave a triangular opening sufficient for purposes of vision. The



eye is dressed with ice-water and usually unfavorable reaction does not ensue. This operation is the result of a consideration of the defects of Graefe's modified linear extraction. Dr. Knapp found that the less the anterior capsule was wounded, the less frequently did capsulitis, iritis and synechia follow extraction. He also observed that when he made a vertical incision of the capsule running up to the marginal incision of the capsule, that the former central opening generally closed, and hence no advantage resulted from such a wound at the primary operation. In fact, it is obvious that such a scar would render the capsule more dense at that point. His experience would not permit him to make a large lacerated opening in the capsule to avoid the closure. For he had found that the more that membrane was wounded the greater was its inflammation, and consequent iritis and synechia. He recognized that in cases where this capsule was not opened, at the center of its area, during extraction, and portions of lens substance were left within the lens capsules, that these fragments did not imbibe aqueous fluid, swell up, and by

pressure induce iritis, and other complications. He thought that the incised wound made at the margin of the capsule healed by the first intention, sealing the lens-sac before fragmental imbibition could result.

Looking at these results, he drew the inference that it was wise to do less in lens extraction, and decided that in this primary operation he would not open the capsule, *save at the margin*, by a clean incision with a delicate, sharp, curved knife. He determined that the extent of this incision, at the edge of the lens, should be sufficient to allow the escape of the lens without lacerating the capsule, in each individual case. By his plan he avoided the introduction of the cystome into the eye, and the dangers of wounding the iris or displacing the lens into the vitreous, with rupture, possibly, of the suspensory ligament, or the hyaloid membrane, and escape of vitreous. These dangers, we may say, might not occur in the hands of so skillful an operator as the Doctor; but he knew it was a result that often obtained, and that it was important to remedy such defects, even if they occurred but occasionally, by some plan of operating. He must have known, too,

that efforts to lacerate the anterior capsule at its centre, even in the hands of skillful operators, was not always successful ; and hence, by laying aside this step in extraction of cataract, he would remove the necessity of *executing that which could not always be performed*. Besides, he also aimed to render this operation more simple and easy of performance. This method is, then, truly an invention, doing away, perhaps, with the most difficult step of extraction.

The cases we have to report, in principle, resemble Dr. Knapp's, in the operative steps and in the failure on my part to lacerate the anterior capsule at the centre of its area in the primary operation, and which he voluntarily omitted in his method for substantial reasons, i. e.: the laceration of the capsule at its centre was rejected at the primary operation. Some of our cases of extraction are reported here, because, though, resembling Dr. Knapp's *involuntarily*, on our part, they nevertheless show clearly the importance of his method, and should form a part of the history of this new operation, and can but add additional testimony to the value of his plan.

CASE I.—Mrs. Eliza D., æt. 50, vigo-

rous, with fair complexion and dark hair and eyes, came to me for consultation, May 30th, 1873. Five years before she had typho-malarial fever, and since has had ague. Her habits were active. She could see with the left eye the light of a candle at 12 feet; and with two candles near her, she could distinguish the lateral one in all parts of the field of vision. She states that she passes a gallon of urine per day, the s. g. of which is 1012, and which shows traces of sugar with Pavy's fluid. (I regarded this as diabetes simplex). Her eyes have been failing since she had the fever. The right was lost from an itinerant, couching the cataract.

The tension of the left eye was $T=1$, the iris was tremulous, and the pupil, under atrophía, did not dilate more than one half. The cataract was hard; the opacity of the lens general, but more marked at the centre. The lens seemed unusually deep in the eye, and the cataract (lenticular and nuclear) was not a large one. On the 9th of June, 1873, I removed the cataract by Von Graefe's modified linear method (upper section) under chloroform. The cataract was small and dense, and

passed readily through the small corneal incision. No reaction followed, and the eye healed rapidly.

Subsequently I found that the effort to lacerate the anterior capsule at its centre had not been successful. There were no synechia as a result of the operation.

On the 12th of July, 1873, having anæsthetized the patient with chloroform 1, and ether 3 parts, previously dilating the pupil as much as possible with atrophine; I entered the cornea in the outer and inferior quadrant, a line from its margin, with a spear-pointed, thin, flat, double-edged knife, four millimètres broad. The patient being recumbent, but little aqueous humor escaped. I then passed through the opening made, a delicate iris hook, avoiding the iris, engaged the hook at the centre of the capsule, let the shaft of the instrument rest in the inner extremity of the corneal wound, and revolved the iris-hook on its axis. The capsule was thin (it had never been inflamed from the extraction), and, as the hook revolved, a central portion of the capsule became twisted into a delicate cord, which, still clinging to the hook, was removed from the eye as the instrument

was withdrawn, leaving a large irregular opening in the capsule. As this cord passed over the lower segment of the iris in withdrawing it from the eye, a slight indentation was left in the curved pupillary border of the iris, from its pressure on the latter, which always remained. In withdrawing the hook its back was maintained next the iris, and the inner extremity of the corneal wound. The eye healed in a few days, although the weather was very warm. No reaction followed or adhesions obtained, and the iris remained tremulous and as active as before the operation. She left for her home in two weeks after the last operation. $V = \frac{8}{1}''$ with $+ 2\frac{1}{2}''$. I saw this lady last summer. She was well, and her vision was still practically as good as it ever was when using her glasses. This lady has two sisters, who have had cataracts; one of these I extracted in 1872, $V = \frac{9}{1}''$ with $+ 2\frac{1}{2}''$, which still continues good to this time.

CASE II. — Charles A. W., æt. 12 years, a healthy school boy, of fair complexion, with dark eyes, came (his mother) to consult me Jan. 22d, 1874. He has had small-pox, and when younger, one convulsion from

indigestion (probably). His parents know of no injury he has sustained. His left eye is normal; but he says he cannot see well with his right, and that the vision of the former is interfered with because of the state of the latter. With the right eye he can see, in a darkened room, the candle at twelve feet, and the lateral light in all parts of the field of vision. The tension is normal; the iris active and unadherent; the lens totally opaque; and there are pigmental deposits over the anterior capsule, denoting previous iritis. The diagnosis was pasty cataract with indurated capsule.

Jan. 23d, 1874. He was chloroformed, and a medium-sized cataract removed by a small section (upper) and Von Grafe's method. The cataract was so soft, that by pressure manipulations the whole lens was removed in a softened state. The case did well afterward, the boy suffering no pain or nausea.

On inspecting the eye a few days afterwards, I found that the anterior capsule had not been lacerated, and on the 21st of April, 1874, I opened the anterior chamber, by incising the cornea in the

horizontal axis, a line from its outer border with a short, broad Beer's cataract knife; passed a small iris hook; tried to remove a central portion of the capsule by revolving the instrument on its axis, but failed to do this; but got a central opening in the capsule. The eye was dressed with cotton and muslin bandage. No reaction followed, and he recovered rapidly.

May 10th, 1874, he read with $+2''$ No. 1 Snellen at 5'', and Nov. 9th, 1874, V with $+2''=7\frac{1}{2}''$ I have seen this boy at intervals since, and his vision remains good. On examination I find the capsule has retracted so that it cannot be seen within the area of the pupil, even to the base above, and that there are no synechia anterior. The iris is active. In this case the capsule was too dense to tear owing to thickening from previous iritis; hence only a central opening could be secured. But it is evident that by traction or atrophy of this membrane the central opening was enlarged. Hence, we may inquire, can a capsule be absorbed at points leaving perforations, which coalesce into a general opening in it, aided by traction and retraction?

CASE III.—This case is reported from memory, as I kept no notes of it. A pauper and inmate of the Muskingum County Infirmary, named Hooper, æt. (approximate) 55, had double cataracts. One eye had been operated upon unsuccessfully. In the other eyeball the tension was less than normal, and revealed cataract, which was of medium density at the cortex, and the nucleus was hard. Some time in September, 1876, I extracted by Graefe's method (upper section), the patient being chloroformed. I incised the capsule at the margin of the lens after iridectomy, and immediately the vitreous began to escape. I did not attempt to lacerate the capsule, but proceeded to remove the lens by the usual methods, which efforts were successful, the lens coming out entire. Not deeming it wise to introduce the cystome after the lens was removed, the eye was closed and dressed with cotton and the pressure bandage. The case did well under colchicum and pot. iodidi. (rheumatic subject); and the eye healed without synechia, leaving a dense anterior capsule without central opening. About six weeks after the extraction, I made an opening in

the capsule by incising the cornea, as in the first case, and introducing a delicate pair of iris scissors (round, two millimètres in diameter at the base, and ten millimètres long in the blades, one point blunt and the other sharp-pointed) opened the blades enough to perforate the capsule near its centre with the sharp point of the scissors, and cut a vertical opening. The pupil was well dilated with atrophine, and the patient chloroformed. The eye was dressed as after the first operation, and the patient kept in bed as is usual after these operations. He did well and recovered without reaction. The last time I saw him, in company with Dr. A. Ball, of this place, he could make out the ace of spades at 20 feet without glasses. (He had never learned to read.) The opening in the capsule was vertical and oval, its edges thickened, and the capsule was bulged forward on a level with the plane of the iris. I hear occasionally from this man, and that he still sees. He does laboring work about the Infirmary.

CASE IV.—Miss Kate K., æt. 36, formerly worked in a wollen mill, was born in Ohio, applied for treatment in October,

1875. She is scrofulous ; her temperament is nervous ; her complexion is fair, hair light, and eyes are grey colored. She has had typhoid fever, and now suffers from facial neuralgia from decayed teeth. She is feeble. She can see with the right eye a candle twelve feet in a dark room, and the field of vision is ample. The external appearance of the eye is normal and the pupils are active.

She has mature lenticular cataract in the right eye and immature in the left. As she still has neuralgia, we directed the extraction of decayed teeth, and gave croton chloral ℥ij and hydrate of chloral, ℥i, and morphia, gr. ii, syrup ℥ij. S. Tea-spoonful as a dose when she had the neuralgia : and cannabis Indica and ex. hyosc. three times daily continuously, with good food. Her general health improved, and on the 27th of January, 1877, I extracted the right lens by Von Graefe's modified linear method (upper section.) The capsule was lacerated in this case, but closed, leaving only a pin-hole opening, insufficient for vision. There was no synechia. The eye healed very well ; but I had some trouble with the neuralgia of the teeth,

which did not affect the eye unfavorably. I gave for this the above chloral mixture, dose every hour until easy or sleepy.

March 17th, 1877, I incised the cornea with the same instrument employed in the first case reported, and at a corresponding point of the cornea. I then introduced the cannula of my cannula eye forceps, (which act in the reverse manner to those usually made) through corneal wound, and when near enough to the capsule pressed out the concealed and very sharp and delicate hook; engaged the hook in the capsule, intending to turn the instrument on its axis; but as the hook returned within the cannula, it cut a central opening large enough for purposes of vision, and very little traction was made upon the capsule in effecting this, so that the margins of the capsule were not disturbed. The instrument was withdrawn, and the eye dressed with dry dressings, and the patient recovered. V. P. with $+2'' = \frac{8}{11}''$ and V. R. with $+3\frac{1}{2}'' = \frac{20}{30}''$. I learned recently that the P. vision of this patient has improved, and that a relation saw her reading a newspaper last August (1879).

CASE V.—Mrs. Susan M., æt, 66, con-

sulted me April 23d, 1877. Her complexion was sallow, and hair and eyes grey. She has had intermittent fever, and neuralgia about the head, but only slightly suffered with the latter disease when she came to me. The eyes looked normal; the pupils were active, and there were no adhesions.

She has nuclear cataracts. That of the right eye is fully developed and small, that of the left eye immature. On April 24th, 1877, after anæsthetizing with Squibb's ether, adding a few drops finally of chloroform on the sponge to induce profound insensibility, I operated as I did in the other cases reported. The knife was entered at the sclero-corneal junction, and brought out in the sclerotic alone, leaving a small conjunctival flap. The iris was excised well at the extremities of the corneal wound. The capsule was lacerated, but not freely, because the lens being small, ing to use the cystome, afforded no point and displacing downwards on attempt-of resistance for the action of the cystome. The anterior chamber was small, but the lens came out whole and easily by external manipulations. I did not think it prudent

to introduce the cystome in the eye to lacerate the capsule after the lens had been extracted. The case did well and no reaction followed. I subsequently found that the opening in the capsule closed, and hence, after dilating the unadherent pupil with atrophine and etherizing, I did on the 24th of May, 1877, a similar operation and with the same instruments, as was done in the case last reported. She saw objects immediately after the operation. The eye was dressed as in the other cases, and no reaction followed. This patient did not get her glasses after she returned to her home, because, as I learned, she found she could read with those she had before the extraction. 12"+. In June, 1877, her physician, Dr. J. M. Axline, saw this patient reading a chapter in the Bible, and I learned subsequently that her vision continued good until she died about a year since of some form of lung disease.

Zanesville, Ohio, Feb. 21st, 1880.

